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ABSTRACT

This student module on safety and health in vocational education is one of 50 modules concerned with job safety and health. This module introduces the principles and practices of safety and health programs in vocational education. Following the introduction, eight objectives (each keyed to a page in the text) the student is expected to accomplish are listed (e.g., State the primary goal of any Occupational Safety and Health program). Then each objective is taught in detail, sometimes accompanied by illustrations. Learning activities are included. A list of references and answers to learning activities complete the module. (CT)

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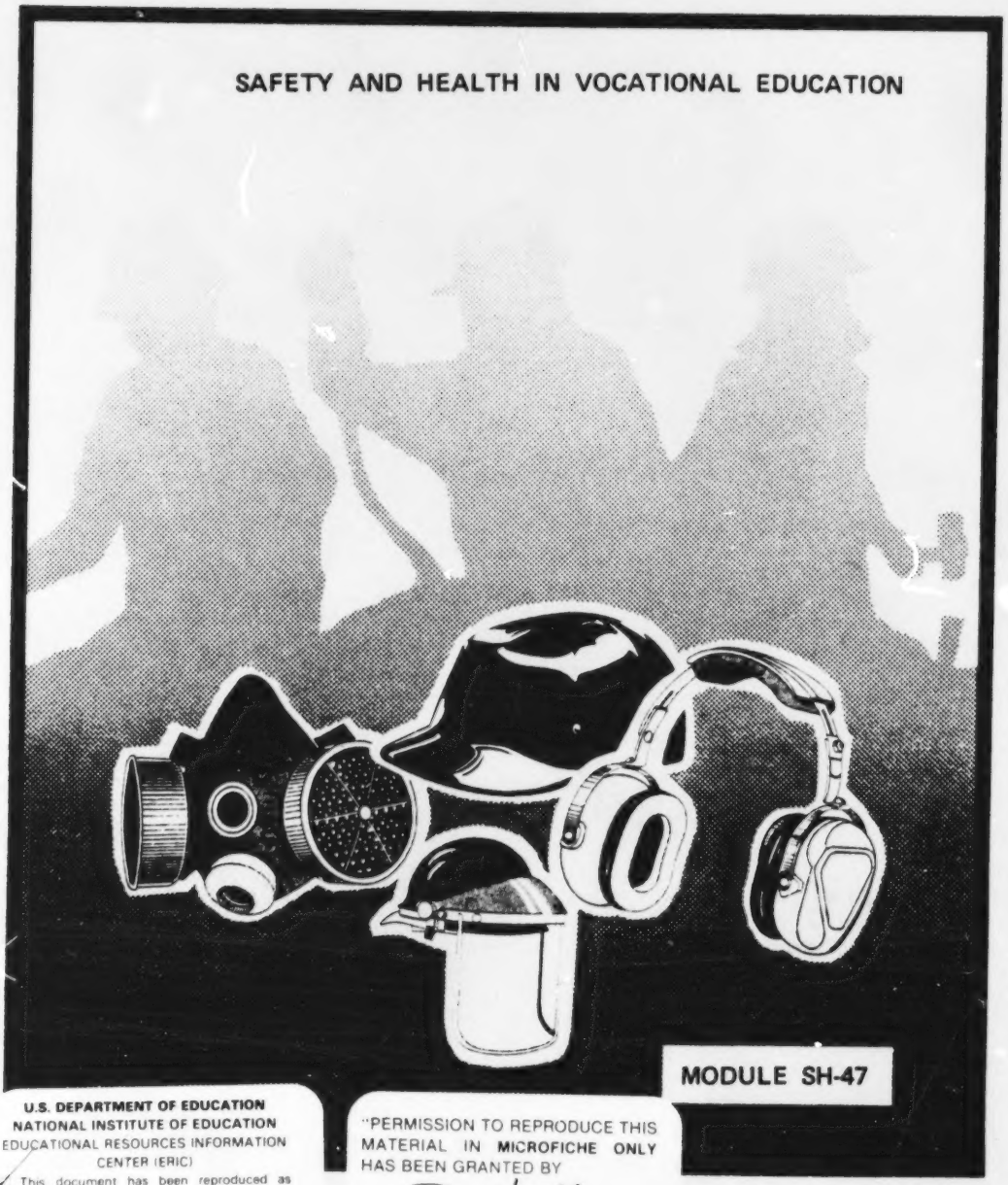

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INTRODUCTION

The quality and effectiveness of the nation's workforce is significantly influenced by our ability to maintain a safe and healthful work environment. Every year, an estimated 300,000 persons experience some form of occupational disease, 12,000 persons die from work accidents, and at least two million more suffer disabling injuries. The 245,000,000 work days lost annually due to job-related illnesses and injuries represent a degradation to the quality of life, a needless escalation in the cost of goods and services, and a serious burden on our nation's productivity.

One of the keys to improved job safety and health lies in the proper preparation of skilled workers, preparation that includes: (1) awareness of hazards, (2) knowledge of safe practices and, most importantly, (3) a conscientious attitude about preserving safety and health in the workplace. The specific aspects of job safety and health should be an integral part of vocational education. Safe work practices should be infused into the training of all skills and knowledge for competent work performance; and safety should be demonstrated, practiced, and insisted upon in the shops, laboratories, and classrooms of our educational institutions.

This module introduces the principles and practices of safety and health programs in vocational education. The module outlines the criteria that should be included in a school's occupational safety and health (OSH) plan and describes seven major functions of such a plan. The delegation of authority is discussed, with an emphasis on the attitudes necessary to build a strong and effective safety and health program.

OBJECTIVES

Upon completion of this module, the student should be able to:

1. State four benefits of effective safety and health programs in vocational education. (Page 3)
2. State three criteria that must be fulfilled for a school to qualify as having a formal OSH program. (Page 5)

3. State the primary goal of any OSH program. (Page 6)
4. Describe seven functions of an effective occupational safety and health program. (Page 7)
5. Describe the role of attitude in a safety and health program. (Page 21)
6. Describe the role of administration in an OSH program. (Page 22)
7. Discuss the delegation of authority in school OSH programs. (Page 23)
8. Discuss emergency plans and OSH maintenance as functions of safety programs. (Page 28)

OBJECTIVE 1: State four benefits of effective safety and health programs in vocational education.

Safety has always been an integral part of vocational education. Yet accidents still happen in school and industry. The best facilities and equipment in the history of vocational education have not been sufficient to prevent all of the accidents and illnesses related to school shop and laboratory operations. Facilities and equipment alone cannot ensure the safety and health of vocational students. The most effective way to provide for a safe and healthful environment is through a comprehensive, formal occupational safety and health (OSH) program. Such a program calls for administrative support and well-defined procedures.

The primary benefit of an occupational safety and health (OSH) program is the reduction in the number and severity of occupational illnesses and injuries in the school. Related to this reduction are direct savings in lowered insurance premiums, OSHA or other agency fines, court costs, accident investigation costs, and repair costs. The indirect losses that accompany a school or work accident are also saved by accident and illness reduction; these losses include time out of school, lowered morale among teachers and students, and possible replacement costs for equipment and facilities.

As the tendency to sue for damages increases in all areas of life, schools must be concerned about vocational education accidents and illnesses not only from a moral standpoint, but also from a legal one. OSH program records can provide documentation of the school's compliance with regulations that apply to its operations.

Besides the immediate benefit of student safety and health, OSH programs can provide a degree of long-term protection to students through the teaching of safety attitudes and procedures. Long after their training period is over, workers will be performing their jobs using the safe habits learned in vocational programs.

Another major benefit of vocational education OSH programs is productivity. Productivity is a national concern today; a national goal of Congress is to increase productivity in American industry. Much of productivity depends upon the worker's attitude towards work, including a positive attitude toward safety and an awareness of those conditions that may create a time loss. Vocational education has established its responsibility in this area and the American Vocational Association has assured Congress that vocational educators can deliver workers who will improve productivity. A business or industry cannot be productive when workers are injured or ill due to unsafe conditions or acts.

ACTIVITY 1:*

1. List four direct savings that are related to the reduction of occupational illnesses and injuries in schools.
   a. _____
   b. _____
   c. _____
   d. _____
2. Fill in the blank.
   a. OSH program records can provide _____ of the school's compliance with safety and health regulations.
   b. OSH programs can offer long-term _____ to students through teaching safe attitudes and practices.
   c. Safety training, by teaching safe practices and an awareness of conditions that create a time loss, aids _____.

*Answers to Activites begin on page 30.

OBJECTIVE 2: State three criteria that must be fulfilled for a school to qualify as having a formal OSH program.

Today, a school has both legal and moral responsibilities toward its employees. No longer is the school under the protection of statutory or sovereign immunity. A school now may be liable in the case of an accident and can be sued for negligence. Schools also must now comply with a number of federal, state, and local regulations regarding safety and health standards. At the state and local levels, schools must take into account worker's compensation, fire safety laws, building and construction codes, sanitation requirements, and a variety of other regulations. At the federal level, the OSHA regulations are the most comprehensive safety and health requirements facing employees. All private institutions and many public ones are under OSHA (at either the federal or state level). Even if the entire school is not under OSHA, there may be on-site OSHA inspections covering any private services offered within the school complex, such as food commissaries. Thus, the school may become inadvertently involved if violations are found. A comprehensive OSH program of good documentation is effective in dealing with these areas of potential liability and noncompliance.

To be considered a formal program, the OSH effort must exhibit certain characteristics. First, it must be recognized and supported by the top level administration (preferably including the board) of the school. Without this recognition and support, it cannot compete for resources, exert authority, or initiate activities that involve the school as a whole. Second, in order to be a program, some planned activities must occur that lead toward defined program objectives. A program is successful only by virtue of what it accomplishes. Third, someone must be designated as being responsible and accountable for the program. Program objectives cannot be achieved without proper direction and coordination of program activities.

All three of these criteria must be fulfilled for a school to qualify as having a formal OSH program.

ACTIVITY 2:

List three characteristics that should be demonstrated for a school's OSH program to be recognized as a formal, viable program.

1. _____
2. _____
3. _____

OBJECTIVE 3: State the primary goal of any OSH program.

The primary goal of any OSH program is to improve the safety and health of the school environment. Such an improvement can be accomplished when vocational educators have extensive knowledge in the factors that contribute to accidents: unsafe equipment and facilities, and unsafe practices in the work area. The OSH program should aim to provide work areas for students in which as many safety features as possible are built in and as many hazards as possible are removed, while still allowing training tasks to be accomplished in an efficient manner. Further, the goal must include teaching of safe practice as an integral part of vocational training.

ACTIVITY 3:

State the primary goal of any OSH program. _____

_____

OBJECTIVE 4: List seven functions of an effective occupational safety and health program.

In order to reduce injuries and illnesses, an effective OSH program must consist of several parts. Work areas must be investigated to determine the location and types of existing hazards. Rules (based on local or national guidelines) must be developed to deal with the problem areas identified. Corrective action must be instigated for those hazards identified. Workers must be trained so that the condition, once corrected, will remain corrected. Some method of inspection and monitoring of work areas must be established. Records of on-the-job illnesses and injuries should be kept. These items are the basis for an effective safety and health program for the local school, industrial, vocational, or career education shop or laboratory.

The seven functions of an effective safety and health program may be listed as:

- Conducting of on-site inspections.
- Development of rules and regulations.
- Correction or control of hazards.
- Investigation of accidents.
- Maintenance of illness and injury records.
- Provision of employee/student training.
- Monitoring and evaluation of program performance.

CONDUCTING OF ON-SITE INSPECTIONS

On-site inspections are essential. In order to avoid accidents and prevent injuries, hazards must be recognized.

Inspections should be made by persons or groups trained in hazard recognition. They may conduct either informal (on-the-spot) inspections to obtain immediate corrective action, or they may conduct formal inspections

on a planned basis. All operational items should be covered by adequate inspection schedules.

Items that should be inspected include structures, machines, tools, equipment, material, methods, and processes. New machinery installation, recently acquired equipment and tools, and purchase of orders for material and equipment should be reviewed, also. Work practices must be observed as well as work equipment.

Inspections should be made in an orderly, thorough, and factual manner. There should be a planned itinerary, with a checklist developed for each area. A blank piece of paper and the assignment to inspect an area will not result in complete or accurate assessment of possible safety hazards. Table 1 shows a typical checklist.

"Imagineering" is an important technique that inspectors should develop in order to be able to visualize hazards and unsafe practices which can occur as well as those that are observed. The inspector should ask questions to discover both the actual and potential conditions of the area.

Inspections should be made not only to detect and correct conditions that have caused or may cause an incident, and to comply with regulations (federal, state or institutional), but also may serve to establish a regular accident prevention program. Additionally, inspections provide further opportunities to train and educate administrators, instructors, or students of safe work practices.

TABLE 1. SAFETY ORGANIZATION INSPECTION REPORT.

Waukesha County Technical Institute

SAFETY ORGANIZATION INSPECTION REPORT

800 Main St., Pewaukee 53072

This form is for use in reporting inspections. Before making an inspection, be sure to review reports of accidents which have occurred since the previous survey so that condition may be investigated, and safeguards recommended where necessary.

NAME OF EMPLOYER _____ DATE _____

LOCATION _____ WEEKLY OR MONTHLY INSP. _____

INSPECTED BY _____ DATE OF LAST INSP. _____

(SHOW NAME OF INSPECTOR) _____

OR NAMES OF COMMITTEE MEMBERS) _____

	Mark Each Item "O.K.", "See Recommendations or "See Note."
FLOORS, FLOOR OPENINGS, WALL OR HOISTWAY OPENINGS--Are all floor surfaces free from protruding nails, splinters, holes, slipperiness, unevenness, loose material, refuse, etc. and are all openings properly railed or otherwise protected.	
STAIRWAYS--Is the condition of supports, treads, stairc overing, handrails, etc. satisfactory. Note whether light is adequate. Stairs should be free of all obstructions.	
ELEVATED RUNWAYS, PLATFORMS, AND LADDERS--Note condition of handrails, toe boards, foot boards, rungs, supports, etc., and see if clear of obstruction and safe for use.	
MACHINES, (A) POINT OF OPERATION--Point of operation guards should be provided for all machines requiring them. Report places where guards have been removed or, are not used, or machines without guards.	
MACHINES, (B) OTHER DANGEROUS MOVING PARTS--All belts, pulleys, gears, sprockets, chains, clutches, and shafting should be guarded if within 7 ft. of floor. Gears and sprockets are dangerous wherever located and should be guarded. Each machine should have a start and stop device in a good working order.	
POWER TRANSMISSION, MECHANICAL--All power transmitting belts, pulleys, flywheels, and shafting within 7 ft. of floor, and gears, sprockets and chains wherever located, should be adequately protected. Prime movers such as engines and motors should be properly guarded.	
ELEVATORS--Make certain that cables, entrance gates or doors, safety devices, signal system, lighting, floor, and starting devices are in good order. Watch for unsafe practices by operators and other employees.	
MATERIALS--Observe whether acids, corrosives, and highly flammable or explosive liquids or other substances are handled and stored in a safe manner. All materials should be stored or piled properly. Provision should be made for safely disposing of empty containers, boxes, and refuse.	
HOUSEKEEPING, LIGHT, VENTILATION--Plant and premises should be kept clean and orderly. Aisles should be kept clear and well defined. Report lighting fixtures out of order, or where inadequate. Windows should be clean. Ventilation should be adequate for healthy conditions and for safety where flammable or explosive fumes, vapor or dust is present.	

PROTECTIVE EQUIPMENT--Wherever goggles, respirators, safety shoes, gloves, leggings, hard hats, or special clothing is appropriate, be careful to observe whether it is being used properly and whether of the proper design for comfort and efficiency.	
HAND TOOLS--Observe hand tools of all kinds and report those in unsafe condition, such as mushroom heads on chisels or hammers, spread jaws on wrenches, splintered handles, defective or improper shields for knives, picks, etc.	
HAND TRUCKS, CONVEYORS, CRANES AND HOISTS--Inspect for defective handles, floors, steps, wheels, controls, tracks, signals, etc. and for spread hooks, worn chain links, cables, etc.	
ELECTRICAL EQUIPMENT--Observe wiring, switch boards, transformers, etc. to see if in good order and that rails, screens, rubber mats, or guards are in place. Observe condition of extension cords and cords on portable electric tools, loaders, etc., and also see that electrical equipment is properly grounded. Where highly flammable, volatile or explosive liquids or vapors are present light bulbs, switches, etc. should be properly enclosed.	
YARDS AND ADJACENT WAYS--See that materials are properly piled, refuse cleaned up and premises are in good order. Runways, walks, driveways and trackage should be kept clear, well defined and in good order. Materials or equipment should not be stored or allowed to remain where they may become a public nuisance. Wherever possible yards should be fenced.	
BOILERS, AIR TANKS, AND OTHER PRESSURE APPARATUS--All pressure apparatus such as air receivers, boilers, pressure cookers, steam jacketed kettles, stills, etc., should be tested periodically and a record maintained. Safety valves and other safety devices should be inspected and tested for accuracy. See that acetylene and oxygen tanks are properly handled and stored.	
FIRST AID EQUIPMENT--See that first aid kits are properly stocked, stretchers, blankets, and other equipment in proper order, first aid room clean and facilities properly maintained. First aid should always be administered by a person properly trained and in event of their absence, injuries should be sent to a physician. Eye cases should never be treated except by a physician.	
FIRE ESCAPES, EQUIPMENT, ETC.--Fire escapes, exits, and passageways should be kept clear, in good order and ready for use. All fire fighting equipment should be tested periodically to see if in working order. Consider all above items occasionally in the light of changed conditions to make certain that they are still adequate.	

RECOMMENDATIONS AND COMMENTS--From your observations and from a review of the accident reports recommend corrective measures. Comment on the accident causes. Word recommendations clearly and number them separately.

Number of accidents since last report _____

Number of previous recommendations still outstanding _____

Number of new recommendations submitted below _____

Signed _____

THIS COLUMN FOR EXECUTIVE OR COMMITTEE USE

RECOMMENDATIONS	
Date Approved	Date Completed

DEVELOPMENT OF RULES AND REGULATIONS

Rules and regulations are essential to controlling conditions and behavior that may contribute to safety and health hazards. They serve to curb unsafe acts and establish safe work practice standards. Rules and regulations can be created for specific jobs by use of the Job Safety Analysis (JSA). The JSA is a systematic, practical method of training and documentation of job hazards. This system consists of four basic steps:

1. Define the job.
2. Break job down into steps - a job procedure.
3. Identify the hazard or hazards in each step.
4. Develop a control for each.

All beginning vocational students should be required to make a careful study of work hazards that may be encountered in their trade or profession within the first few days of instruction. Hazard recognition means seeing the hazard twice: first, recognizing that a hazard exists and secondly, visualizing the possible consequences of allowing a hazard to continue to exist uncorrected.

The following form (Table 2) has been used for preparation of JSAs. Although it does take more time to prepare a personalized JSA for each student activity, there is not only the benefit of increased safety performance, but improved quality and efficiency of instructional activities. These work practices must be monitored and enforced throughout the future to control hazards.

CORRECTION OR CONTROL OF HAZARDS

In order to maintain a safe and healthful workplace, hazards that now exist or that could develop must be identified, and procedures created to eliminate or control these hazards. This activity will vary between instructional areas and will be keyed to facility, process, student, and instructor.

Unsafe conditions should ideally be eliminated. A safer substance, tool, or method can be substituted. To augment other corrections or if no

TABLE 2. JOB SAFETY ANALYSIS.

JOB SAFETY ANALYSIS

Department

Section

Position title of man (men) who does (do) the job

Required and/or recommended personal protective equipment

SEQUENCE OF BASIC JOB STEPS	POTENTIAL ACCIDENTS OR HAZARDS	RECOMMENDED SAFE JOB PROCEDURE
Break the job down into it's basic steps; e.g., what is done first, what is done next, and so on. You can do this by (1) observing the job, (2) discussing it with the operator, (3) drawing on your knowledge of the job, or (4) a combination of all three. Record the job steps in their normal order of occurrence. Describe what is done, not the details of how it is done. Usually three or four words are sufficient to describe each basic job step. For example, the job of "replacing a light bulb" may break down into basic steps as follows: 1. Get a step-up ladder. 2. Climb ladder. 3. Remove light globe. 4. Replace light bulbs. 5. Replace light globe. 6. Descend ladder. 7. Remove and store ladder.	For each job step, ask yourself what accidents could happen to the man doing the job step. You can get your answers by (1) observing the job, (2) discussing it with the operator, (3) recalling past accidents, or (4) a combination of all three. Ask yourself: Can he be struck by or contacted by anything, can he strike against or come in contact with anything; can he be caught in, on, or between anything; can he fall, can he overexert; is he exposed to anything injurious such as gas, radiation, welding rays, etc. Record and number potential accidents by using the right abbreviation for the type of accident that could happen and by describing the agent of contact or exposure. For example, SB—cranehook means the man could be struck by a cranehook. Use these abbreviations: 1. SB -Struck by 2. CBy-Contacted by 3. SA -Struck against 4. CW -Contact with 5. CBe-Caught between 6. CO -Caught on 7. CI -Caught in 8. FB-Fall-to-below 9. FS-Fall-same-level 10. O -Overexertion 11. E -Exposure 12. CC-Contact Chemicals, Poisons	For each potential accident or hazard, ask yourself how should the man do the job step to avoid the potential accident, or what should he do or not do to avoid the potential accident. You can get your answers by (1) observing the job for leads, (2) discussing precautions with experienced job operators, (3) drawing on your experience, or (4) a combination of all these. Be sure to describe specifically the precautions the man must take. Don't leave out important details. Number each separate recommended precaution with the same number you gave the potential accident (center column) that the precaution seeks to avoid. Use simple do or don't statements to explain recommended precautions as if you were talking to the man. For example: "Stand clear of lift before signaling." Avoid such generalities as "Be careful," "Be alert," "Take caution," etc. Then, even before you have completed this column, ask yourself if there is a different way to do the job that is safer and better all around. If you have any such ideas, jot down the core of the idea, and then discuss it with higher supervision.

APPROVED:

GEN'L FOREMAN ..... DATE .....

SUPT. ....

GEN. SUPT. ....

SAFETY ENGINEER ....

Signature of Supervisor making Job Safety Analysis — Date

other alternative is suitable, the student or employee can be protected with goggles, shields, aprons, earplugs, or other appropriate personal protective equipment. Unsafe practices must be addressed through safety education, and constant vigilance. In some cases, rewards and penalties may be helpful in reinforcing safe and unsafe practices, respectively.

INVESTIGATION OF ACCIDENTS

If an accident or near incident has occurred, it is important that the cause be identified and controlled to prevent recurrence. Six basic questions form the core of accident investigation; these are shown in Figure 1.

Figure 1. Six basic elements of accident investigation.

The main reason for accident investigation is to eliminate problems - not to fix blame, find fault, or give punishment. It is important to investigate incidents as soon as possible. The investigation should include a description of the accident (the who-what-where-when), an analysis of causes (the why), and preventative or follow-up action to lower probability or re-

currence (the how). The form which follows (Table 3) is a sample of an accident investigation form currently in use at a midwestern vocational-technical education facility. It is reviewed by safety committee members, and actions are taken to eliminate or correct the contributing factors, either unsafe acts or unsafe conditions.

TABLE 3. SUPERVISORS INVESTIGATION OF ACCIDENT. (HOW IT HAPPENED AND WHY.)

RUSH TO: W.C.T.I. Loss Prevention Review Board

Waukesha County Technical Institute

SUPERVISORS INVESTIGATION OF ACCIDENT
(How It Happened and Why)

Each accident should be investigated irrespective of whether the result was serious or minor. The object is to prevent recurrence and it is only by thorough investigation (interview injured person, visit scene of accident if necessary, talk to witnesses) that the real causes can be determined and corrected.

FULL NAME OF INJURED PERSON			DEPT. OR CLASS	
AGE OF INJURED	LENGTH OF SERVICE	LENGTH OF SERVICE ON PRESENT JOB	DATE INJURED	HOUR INJURED

WHAT WAS HE DOING WHEN HE WAS HURT?

HOW DID ACCIDENT OCCUR?

DESCRIBE INJURY

CAN INJURED RETURN TO WORK ON NEXT REGULAR SHIFT OR CLASS?
YES_____ NO_____

IF "NO" ESTIMATE HOW LONG BEFORE RETURN.

PLEASE ANSWER THE FOLLOWING:	CHECK "YES" OR "NO"	
1. Was injured properly instructed in safe and efficient method?	YES	NO
2. Did he violate any instructions?	YES	NO
3. Was necessary protective equipment worn? (Example: Goggles, Safety Belt, Hard Hat)	YES	NO
4. Did poor housekeeping contribute to accident?	YES	NO
5. Did horseplay cause the accident?	YES	NO
6. Was it caused by something which needed repairs?	YES	NO
7. Should a guard be provided?	YES	NO
8. Did any bodily defect contribute to accident?	YES	NO
9. Was it caused by an unsafe act?	YES	NO
10. Did injured report to first aid immediately?	YES	NO

GIVE US YOUR HONEST COMMENTS ON QUESTIONS BELOW. WE ARE NOT TRYING TO BLAME ANYONE. YOUR OPINION MAY HELP US TO PREVENT REPETITION.

What do you consider the real cause of this accident?
(Please do not use the word "Careless")

What steps are <u>being taken</u> to prevent similar accidents?

What other steps should be taken to prevent recurrence?

INSTRUCTOR OR SUPERVISOR | DATE

(Please complete this within 48 hours after injury.)
(Use back if necessary.)

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There are often several contributing factors to an accident. Too often the immediate cause is assumed to be the only cause. Supervisors should seek out all the contributing factors, as among them may be found the underlying cause of the accident. This is best illustrated by a few actual cases:

- A concern reported several "slips on floors." The immediate cause of these accidents was an oily condition on the floor. A temporary remedy would have been to wipe up the oil promptly. The facts as uncovered by the investigations showed that oil dripped from oil cups on overhead motors. It appeared that the oiler was careless and spilled oil or allowed the cup to overflow. However, it was noted that the step ladder he was using was too short and because he was unable to see what he was doing, he often overflowed the cups. The corrective remedy for "slips on floors" was to provide the oiler with a higher step ladder.
- A department store reported a large number of falls on stairs. All stairways were of good standard design. Everything pointed to carelessness or haste on the part of patrons, but analysis of the records showed that 70% of the accidents occurred on one particular stairway late in the afternoon, especially during late fall and winter months when natural light was lacking. Improved artificial lighting effected an immediate reduction in stairway accidents.

Accidents are caused by unsafe acts or unsafe conditions; or a combination of both. Investigation, analysis, and interpretation of the facts surrounding accidents should be used to prevent the same thing from happening again at the same place, or at other places under similar conditions. To make a thorough investigation of an accident, it is desirable to visit the scene in order to visualize actual conditions. Original reports often fail to record some of the most important details, and detailed reports are necessary and economical as they may be the only means by which a costly accident record can be improved.

Some unsafe practices and conditions are listed in Table 4. These lists are by no means inclusive, but should serve to stimulate lists that are more specific and applicable to specific occupational areas in vocational education.

TABLE 4. UNSAFE PRACTICES AND UNSAFE CONDITIONS

UNSAFE PRACTICES
1. The operation of equipment without training or authority.
2. Failure to clean up oil and chemical spills.
3. Operating equipment at improper speeds.
4. Removal and bypassing of safety devices.
5. Use of defective equipment.
6. Improper use of equipment.
7. Failure to provide properly fitted personal protective devices.
8. The use of alcohol and drugs.
9. Improper lifting techniques.
10. Improper loading and placement of pallets.
UNSAFE CONDITIONS
1. Poor housekeeping.
2. Inadequate protective devices on equipment.
3. High noise levels.
4. High levels of dusts, fumes, mists, vapors and gases.
5. Fire and explosion hazards.
6. Overall congested areas.
7. Excessive radiation levels.
8. Inadequate first-aid facilities.
9. Defective personal protection equipment.
10. Poorly-trained employees and supervisors.

MAINTENANCE OF ILLNESS AND INJURY RECORDS

Illness and injury records provide one important measure by which safety and health activities can be evaluated. A review of these records, will help identify high hazard areas to which immediate attention must be directed. Illness and injury records should not be regarded as a mere bookkeeping activity, but as a tool with which current safety performance can be evaluated and future improvements can be planned.

Everyone in the shop should be familiar with proper steps to take in case of a shop accident. These procedures should be posted in a conspicuous spot in the instructional area. First and foremost should be the attention given to the injured person, if attention is necessary. Determine in advance who will be responsible for securing medical aid, notifying parents or responsible person, and who will be responsible for accident investigation.

Figure 2. Injuries, no matter how mionor , should be reported and treated at once.

For every serious personal injury, there will be thirty property damage accidents and six hundred near misses. It is imperative that all accidents, personal injury and property damage accidents as well as near misses, be investigated as soon as possible (Figure 2).

A standard accident report form should be available. The accident report form provides relevant information used in documenting an injury. It is an example from which an individualized report form may be devised. This form would be completed by the injured person if that person is able to do so.

PROVISION OF SAFETY AND HEALTH TRAINING

In order to have an effective safety program, there must be an effective training program. Safety training will ideally be integrated into a course of study. Students in vocational programs should learn not only how to work, but how to work safely.

Safety consciousness can be developed by conducting "shop talks" or "toolbox meetings" in order to discuss some point of safety as the occasion

arises. A short and informal discussion of proper shop dress will be better remembered and received if it is presented in the work environment. Student participation should be encouraged in the development of safety awareness materials through posters, bulletin boards, and a suggestion box from which not only safety concerns of students can be submitted, but possible future topics for formal and informal instruction. A possible assignment could be to research a safety or health problem, and prepare materials for class presentation either on an individual or a group basis.

Shop demonstrations of proper use and care of personal protective equipment used in typical job situations will help make the student more aware of his or her personal responsibility to cooperate with established policy.

Each individual who frequents a shop or lab, needs to know and apply a code of safety practices. Although requirements for different areas will obviously be necessary, "code of safe practices" will generally be applicable. A code of safe practices should basically include the following points:

1. No student is expected to undertake an activity until receiving proper job instruction and authorization to proceed. Proper job instruction can be summed up as:
   - Prepare the student to receive instructions, explain what will be done.
   - Present the operation, show the student what is to be done.
   - Practice the operation, allow the student to demonstrate the operation.
   - Provide follow-up to assure the student continues to perform properly.
2. No student should undertake a job that appears to be unsafe.
3. All guards must be in place and remain in place.
4. All unsafe conditions must be reported as soon as they are discovered.
5. Injuries and illnesses must be reported immediately, no matter how slight they appear to be.
6. The students are aware of and encouraged to participate in the safety program, and made to feel confident that safety needs and concerns will

receive prompt attention and, if necessary, corrective action.

7. The use of eye protection or other personal protection will be explained, and enforced without exception. Rules not observed by all are unworkable as well as unfair.

MONITORING AND EVALUATION OF WORKPLACE PERFORMANCE

If a safety and health program is to survive and continue to be effective, it must be monitored and evaluated. Present requirements may change or new ones may be added as activities warrant. Safety and health committees (Figure 3) have proven valuable in this monitoring role in industry and can serve vocational-technical institutions as well. The safety and health committee can review safety performance and its relationship to productivity and efficiency, setting priorities for safety and health expenditures and education.

Figure 3. Review of accident reports may indicate areas of high risk.

A safety committee should have not only top administrative support but should include all levels of personnel. Smaller subcommittees should be formed to zero in on key areas, and should meet regularly. When problems

Figure 4. Inspection checklists provide a systematic approach to hazard identification.

are recognized, they should be acted on immediately; interest in safety will soon flag if corrective actions are not apparent.

The safety and health committee can be responsible for making inspections (Figure 4) as well as preventing and correcting hazards, arranging health and safety training as well as reviewing accident and illness reports.

Creating awareness of job hazards is not enough; the safety committee must also promote development of safety attitudes, by acceptance and participation.

ACTIVITY 4:

1. Mark each statement TRUE or FALSE.

   ___ a. On-site inspections should be carried out with a checklist.

   ___ b. The main reason for investigation of accidents is to fix blame.

   ___ c. Safety training is ideally provided in a separate safety course.

2. List the four steps in a Job Safety Analysis.

   a. _____

   b. _____

   c. _____

   d. _____

3. Fill in the blank.

   a. Every individual who uses the shop or lab needs to know the _____ _____ _____ _____.

   b. The four steps involved in a proper job instruction can be summed up as _____, _____, _____, and _____.

OBJECTIVE 5: Describe the role of attitude in a safety and health program.

Attitudes toward safety are extremely important. Psychologists tell us that attitudes and habits ar formed early in life and that, to a large extent, they determine one's success or failure in subsequent activites. An attitude as defined by Webster is, "a frame of reference that condition one's response or actions." An attitude of safety awareness will condition how safely a student or worker will respond in a working situation.

For example, air passengers will fasten their seat belts with little or no discussion when the "fasten belts" sign flashes on, but typically only 20 to 30% will use automobile seat belts. The injury and death toll is much higher in automobiles - in total, per passenger mile, per capita or on any other basis. People who will carefully pack a teacup for mailing will travel at high speed on the highway without fastening their seat belts. Certainly there is no disputing the value of human life over a teacup. Attitude and awareness are the key factors in safe practice.

Worker attitude is just as important as knowledge of skills. The attitude will control how skills are applied. Without it, students will misuse tools and equipment or use them unsafely. Improper use and the lack of knowledge accompanied by a poor attitude or safety consciousness will lead to the development of poor habits. Such poor habits will be repeated in the workplace and will be difficult to break.

Habits come from the repeated application of attitudes, so trainees and students must be taught awareness of safety and the proper attitudes from the beginning of any training program.

ACTIVITY 5:

Fill in the blanks.

1. _____ come from the repeated application of attitude.
2. Worker attitude controls how _____ are applied.

OBJECTIVE 6: Describe the role of the administration in an OSH program.

The support of the school administration for the OSH program is essential for at least two reasons. First, without the commitment of top administration, the OSH program will be unable to compete with other endorsed programs for the needed share of funds. Second, without visible support from the top administration, other members of the school may be reluctant to cooperate fully in the safety and health effort.

Endorsement of the administration for the OSH program is usually demonstrated initially by the issuance of a policy statement. To be effective, the policy statement should be issued in printed form to all school personnel by the highest school administrator. This policy statement should reflect:

- The importance which the school administration places on the health and well-being of its staff and students.
- The emphasis the school places on efficient operations with a minimum of accidents and losses.
- The intention of integrating hazard control into all shop operations.
- The necessity for active leadership, direct participation and enthusiastic support of the entire school organization.

- The intent of the school administration to bring its facilities, operations, machinery, equipment, tools, etc., within compliance with health and safety standards and regulations.

ACTIVITY 6:

Name two reasons why administrative support is essential to the success of an OSH program.

1. _____

_____

2. _____

_____

OBJECTIVE 7: Discuss the delegation of authority in school OSH programs.

For the OSH program to be successful, the responsibility for various aspects of safety and health must be clearly delineated. Overall responsibility should be assigned to a single program administrator. Continuing administrative support is best achieved by appointing someone from top administration in this capacity. The program administrator serves as the primary advocate in obtaining necessary funds for safety and health, as the ultimate authority behind the major directives of the program, and as the key person in maintaining school-wide interest and motivation in the program.

Responsibilities for the OSH program can be delegated by the program administrators at the following levels:

- Administrators.
- Department heads.
- Instructors.
- Students.
- Student shop foremen.
- Purchasing agents.
- Maintenance personnel.

- Safety committees.
- Parents.

Administrators are responsible for making clear their full commitment to the OSH program as it gets underway. It is their drive that can get the program started and their continuing support that ensures its growth and progress.

The industrial and vocational department heads are in strategic positions within the school setting. Without their full support, the best designed health and safety program will not be effective. Their leadership and influence ensure that safety and health standards are enforced and upheld in each individual area and that standards and enforcement are uniform throughout the school. Among their many responsibilities are the following:

1. To make certain that materials, equipment and machines slated for distribution to the shops under their jurisdiction are hazard free or that adequate control measures have been provided.
2. To make certain that equipment, tools and machinery are being used as designed and are properly maintained.
3. To keep abreast of accident and injury trends occurring in their shops and to take proper corrective action to reverse these trends.
4. To investigate all accidents occurring within the shops under their supervision.
5. To see to it that all hazard control rules, regulations and procedures are enfoced in the shops they supervise.
6. To require that a Shop Operations Hazard Analysis be conducted for each operation.
7. To require that hazard recognition and control information be included in each instructional module and demonstration session.
8. To actively participate in and support the Safety and Health Committee and to follow up on its recommendations.

Instructors have a moral and professional responsibility to safeguard and educate those who have been placed under their supervision. Thus, instructors are generally responsible for creating a safe and healthy instructional setting and for integrating hazard recognition and control into all aspects of the curriculum. By their careful monitoring they can prevent accidents for which the school carries liability.

The instructors, like the supervisors or foremen in industry, are the eyes and ears of the shop control system. On a day-to-day basis,

instructors must be aware of what is happening in their respective shops, who is doing it, how various tasks are being performed and under what conditions. The chief safety and health responsibilities of instructors are listed below:

1. To train and educate students in work methods and techniques which are free from hazards.
2. To demonstrate an active interest in and comply with school safety and health policies and regulations.
3. To actively participate in and support the Policy and Shop Safety and Health Committees.
4. To supervise and evaluate student performance with consideration given to safe behavior and work methods.
5. To monitor the shop on a daily basis for human, situational and environmental factors capable of causing accidents.
6. To correct hazards detected in their monitoring or to report such hazards to the persons who can take corrective action.
7. To investigate all accidents occurring within their shops to determine cause.

The students constitute the largest segment of the industrial/vocational school population. Well-trained and educated students who actively participate in the safety program are probably the greatest deterrent to damage, injuries and death in the industrial/vocational school shop. The most common student responsibilities are listed below:

1. To obey school safety and health rules and regulations and work according to standard shop practices.
2. To recognize and report to the instructor hazardous conditions or work practices in the shop.
3. To use protective and safety equipment, tools and machinery as they were designed.
4. To report all injuries and exposure to toxic material to the instructor as soon as possible.

In a well balanced industrial/vocational education safety and health program which includes active participation by the students, a student sometimes serves as the student shop foreman. The job of this student is to inspect, detect and correct. The specific responsibilities of the student shop foreman are:

1. To encourage fellow students to comply with shop safety and health regulations.

2. To detect unsafe practices and hazardous machinery, tools, equipment etc.; to take corrective action when possible; and to report to the instructor the hazard and the corrective action taken or still required.
3. To participate in accident investigations.
4. To represent students on the Shop Safety and Health Committee.

Those responsible for purchasing items for the industrial/vocational education shops, whether they be department heads or specially designated persons, are in a key position to help reduce hazards associated with school shop operations. Among the specific responsibilities of those who purchase items are:

1. To be certain that tools, equipment and machinery are ordered and purchased with adequate consideration for student health and safety and with adequate protective devices.
2. To obtain adequate information on the health hazards associated with substances and materials used in shop operations.

Those involved in maintaining equipment, machinery and facilities play an important role in reducing accidents in the industrial/vocational education shop. Among the responsibilities of those in maintenance are the ones listed below:

1. To perform construction and installation work in conformance with good engineering practices.
2. To comply with acceptable safety and health standards.
3. To provide planned preventive maintenance on electrical systems, machinery, equipment, etc., to prevent abnormal deterioration, loss of service, or safety and health hazards.
4. To provide for the timely collection and disposal of scrap materials and waste.
5. To actively participate in and support the Safety and Health Committee.

Safety and Health Committees are generally made up of department heads, maintenance personnel, instructors, students, and administration representatives. Among their responsibilities are the ones listed below:

1. To survey shop facilities for safety and health hazards.
2. To advise administration of safety and health hazards found and to offer recommendations for their correction.
3. To promote and evaluate shop programs in the recognition of safety and health hazards.

4. To critically examine shop safety and health practices and the safety information contained in materials and curricula.
5. To evaluate the acceptability of safety devices and personal protective equipment to be purchased for the school shops.
6. To conduct accident investigations.

Although parents are not thought of as part of the organizational framework essential to an effective industrial/vocational education safety and health program, their support and understanding will markedly strengthen such a program. Parents can complement the school effort by placing a strong value on safety and health while their children are at home, involved in recreation or being transported. Parents who have been informed about the aims and importance of safety education willingly will accept the following responsibilities as well.

1. To actively support the enactment and enforcement of school regulations that mandate the acquisition of the most qualified and experienced instructors, as well as the acquisition of equipment and facilities that conform to acceptable safety and health standards for industry.
2. To be aware of the potential illness and injury their children are exposed to during their educational and training process.
3. To support the instructor and the school administration when penalties must be assigned for violations of safety and health rules.

With the support of each link in the organizational chain, an effective industrial/vocational education safety and health program can be established and maintained.

ACTIVITY 7:

Match the personnel on the left with the program functions on the right.

1.	Department heads.	a.	To train and educate students in safe work methods and techniques.
2.	Students.	b.	To provide planned preventive maintenance on equipment.

	3.	Maintenance personnel.	c. To obey school safety and health rules and regulations in performing class work.
___	4.	Instructors.	d. To support the instructor and administration when penalties for safety violations must be assigned.
___	5.	Parents.	e. To keep informed of accident trends occurring in their shops and to take proper corrective action regarding these trends.

OBJECTIVE 8: Discuss emergency plans and OSH maintenance as functions of safety programs.

Emergency Action Plans are those operational plans made to contend with emergencies and disasters such as fire, toxic chemical releases, hurricanes, tornadoes, blizzards, floods, etc.

The OSHAct states that the plan must be written and must state the actions that employees are to take in fires and other life-threatening emergencies. The plan must include emergency escape routes and procedures, methods of announcing emergencies, types of evacuations for different situations, methods of accounting for and/or storage of the item under consideration. Workers have an added incentive to make better use of tools and equipment that are properly maintained, which in turn leads to better satisfied and safer employees or students.

ACTIVITY 8:

List one thing that would be considered Routine Corrective Maintenance" and one thing that would be considered "Preventive Maintenance."

1. _____

2. _____

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ANSWERS TO ACTIVITIES

ACTIVITY 1

1. (Any four).
   a. Insurance premiums.
   b. OSHA or other agency fines.
   c. Court costs.
   d. Accident investigation costs.
   e. Repair costs.
2. a. Documentation.
   b. Protection.
   c. Productivity.

ACTIVITY 2

1. Recognition and support of top-level administrators.
2. Planned activities must occur that lead to program objectives.
3. Someone must be designated as accountable for the program.

ACTIVITY 3

The primary goal of any OSH program is to improve the safety and health of the school work environment.

ACTIVITY 4

1. a. True.
   b. False.
   c. False.
2. a. Define the job.
   b. Break the job down into steps - a job procedure.

c. Identify the hazard or hazards in each step.

d. Develop a control for each.

3. a. Code of safe practice.

b. Prepare, present, practice and provide follow-up.

ACTIVITY 5

1. Habits.
2. Skills.

ACTIVITY 6

1. Competition for funds.
2. Gaining of cooperation from other members of the school.

ACTIVITY 7

1. e.
2. c.
3. b.
4. a.
5. d.

ACTIVITY 8

(Any one.)

1. Machine cleaning and lubrication.
2. Cleaning windows, floors, light fixtures, etc.
3. Disposal of scrap and trash.
4. Replace ventilator/heater filters.
5. Inspection of tool condition.